



**US Army Natick Soldier Research,  
Development, and Engineering Center**



# **Expeditionary Basecamp Passive Protection**

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Special Projects Team

Unclassified

**Warfighters in highly mobile forward units have no inherent ballistic protection in shelters and no time/manpower to install traditional ballistic protection (sandbags, concrete barriers). Multiple requests for ballistic protection for shelters have been received from theater.**



**Creating a low cost ballistic solution requires advancing current material technology, systems integration, and manufacturing processes.**

## *The Solution:* Modular Ballistic Protection System (MBPS)

- Rapidly deployable ballistic protection
- Expeditionary protection from multiple ballistic threats
- Lightweight, Low Cost
- Redeployable (install around 32' x 21 1/4 man-hours)
- No Material Handling Equipment or special tools
- Immediate protection in all battlefield environments
- Withstands high impulse blast overpressures



**NO TOOLS or MHE**



**MBPS** has evolved into a stand-alone ballistic protection system.

- Universal protection for shelters, equipment, supplies, or personnel.
- Can provide a quickly deployed protective fighting position.
- Effectively withstands blast loads in a multitude of soil conditions.

**Current Prototypes:**

**Weight:** 3.8 lbs/sq.ft.

**Thickness:** 0.4 inches

**Cost:** \$20 per sq.ft.

**Protection:** Fragmentation & Ballistic.

**Protection levels can be tailored to need.**

## ARENA TESTING



## BLAST OVERPRESSURE TESTING

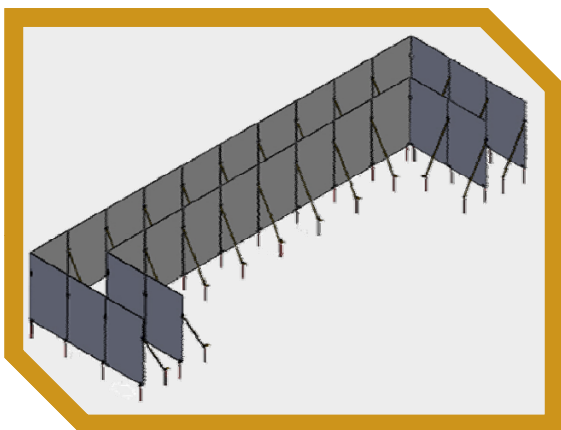


**0.4" thick**



## Up-armoring

Layering & Metallic Strike Face

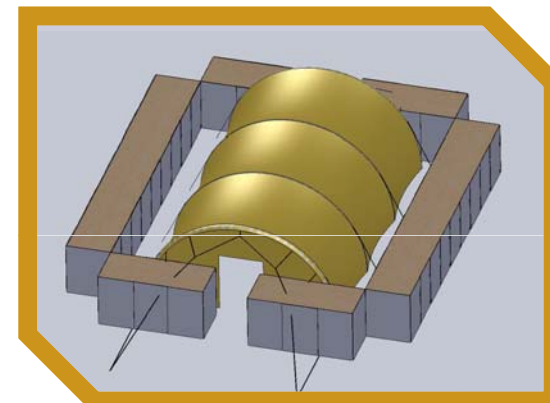


Higher levels of protection have been requested, multiple uparmor solutions possible:

- Metallic strike face add-on
- System layering approach
- Higher cost materials

## 2G Prototype

Anchorless & Fillable



Second generation **MBPS** concepts are in development:

- Anchorless design
- Two layer design, ability to fill if possible/needed.

## Flexible Solution for Air-supported Shelters



Through the **Small Business Innovative Research (SBIR)** program, a flexible ballistic solution was sought for an approach to protect shelters with unique arc shapes of non-traditional frame shelters.

### **NSRDEC Objectives:**

- Provide a level of protection against small arms and fragmenting munitions.
- Low volume pack.
- Utilize unique blast response over rigid solutions.

### **Phase II SBIR:**

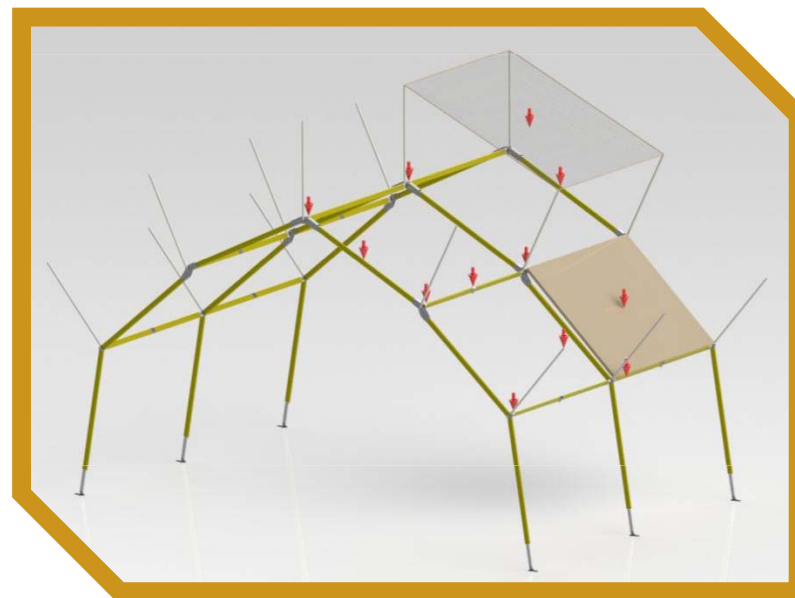


## Overhead Threat Protection (OTP)

The task of developing an Overhead Threat Protection (OTP) system for direct hit survivability is also being pursued through the **Small Business Innovative Research (SBIR)** program.

### NSRDEC Objectives:

- Quickly set up/deployed
- Reusable/redeployable
- Support the weight of ballistic paneling and pre-detonation layer at a stand-off
- Withstand large dynamic (impulse) loading
- Minimal deflection into the covered volume.



### Phase II SBIR:



## Ballistic Requirement

- Meets requirement document specified fragmentation protection capability (Note: Can be tailored to need and utilize same system)
- Performs well against relevant munitions in arena testing and modeling

## General Performance Requirements

- Man-portable, No Heavy Equipment, No Special Tools
- Transportability: Tricon or 463L pallet (10,000 lb limit)
- Deployment / Strike times: 1 hour / 4 warfighters / 32'x21' shelter
- Extreme Climates: Temperature, Snow, Wind.
- Panel Durability: Impact Testing, Accelerated Weathering (UV, Water Absorption), Fire Resistance.



Unclassified





# Program Status



- **REF 10 liner**
  - 2 MBPS SA systems in theater
- **Tech Transition**
  - Transition partner PM Force Sustainment Systems (PM FSS)
  - Moving forward with Stand Alone design only
  - Milestone A signed in 1QFY11
  - Milestone B tied to requirements document, awaiting Force Provider Expeditionary (FPE) CPD signature.
- **Test community IPT established**
- **NSN and Interim Tech Manual established with NSRDEC Quick Reaction Cell (QRC) funding**
- **Sponsoring Threat Summit**
  - Participants: ARL, NGIC, ATEC, AWG, NSRDEC, PM FSS



# Partnerships



- Product Manager Force Sustainment Systems (PM FSS)
- AEWC Advanced Structures and Composites Center at the University of Maine - Orono
- National Ground Intelligence Command (NGIC)
- Army Test and Evaluation Command (ATEC)
- NSRDEC - Quick Reaction Cell (QRC)
- Army Corps of Engineers (ERDC)
- Air Force Research Lab (AFRL)
- Army Research Lab (ARL)
- NSRDEC - Ballistic Technology Team (WARPAD Directorate)
- Technical Products Inc. (TPI)
- Tex Tech Industries





# Questions?



## POCs

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